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Monthly Engineering Report No. 12

25X1

Improvement of Wide-Band FM Radar
Detection Techniques

Period Covered: 1 September 1961 to 30 September 1961

DOCUMENT NO. 9
NO CHANGE IN CLASS. ☐
☐ DECLASSIFIED
CLASS. CHANGED TO: TS S ©2010
NEXT REVIEW DATE: _____
AUTH: HR 70-2
DATE: 230/66 REVIEWER: 010958

25X1

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Page 1 of 3

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SECRET**CONFIDENTIAL**General Comments

This report covers the twelfth period of contract activity for improvement of FM radar detection techniques.

The job has been staffed by one full-time senior engineer, one part-time senior engineer, and one full-time engineer.

Activities of the Report Period

During this report period the fabrication of the seven Q-multipliers was completed. Each filter unit offers approximately 20-db rejection of signals in the adjacent filter.

The principle accomplishment of the period was the assembly and testing of the complete system. The system including r.f. head, i.f. section, analysis section, and display was assembled. Both the single-feed and dual-feed antenna arrangements were assembled and tested in operation, both with and without broadband sesrodyne frequency translation. The display is arranged so that these range divisions, each containing seven discreet ranges, are presented in succession. When the antenna is scanning an enormous amount of information is presented, and it is necessary to make photographs rather than rely upon simple observation and memory. Using the photograph technique, an MC-30 microphone can be detected in air or behind simple structures, and its range determined. These results complete the construction and testing phase of the overall program, but do not constitute a system evaluation.

Page 2 of 3

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SECRET**CONFIDENTIAL****Program for the Evaluation Phase**

Because of the inclusion of the experimental scanning antenna system, and the overall system flexibility, the present system is capable of a much more extensive evaluation than was originally anticipated. It is estimated that a proper evaluation would require the services of an average of two and one-half engineers for a two-month period. This evaluation has been formally proposed but is not a part of the present task.

25X1

The overall objective of the proposed evaluation is to assess the operational potential of this equipment for its intended purpose. Among the specific objectives, each of the several antenna-translator combinations will be examined, and the most effective arrangement will be determined. Factors affecting the dynamic range of the system and of the oscillograms will be determined. Also, the effectiveness of the system in the presence of various wall materials will be determined. Some improvements in the i.f. analysis, and display subsystems are anticipated. Finally, a one-week field evaluation of the system will be made at a site provided by the customer.

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